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SOME TETTIGIAN STUDIES.

By J. L. HANCOCK.

In Prof. Ignacio Bolivar's Essay, '87, there is collectively brought together under the genus *Paratettix* a number of species which I have found necessary to revise. We find in the disposition of species there are three sections, the first, page 270, being separated from the rest of the series by the characters of the posterior tarsi, as follows: Section one, first and third articles of the posterior tarsi equal in length, under which two species are thus grouped, namely: *Paratettix peruvianus* Bol. and *Paratettix cayeunensis* Bolivar.

These two species belong to the same category as the new species described here and they form a distinct genus, to which I have given the new name, *Alloettix*, the type being *prolongatus*. They, moreover, approximate the *Metrodorae*, instead of the *Tettigie*, and are in consequence dropped from the original *Paratettix* series entirely.

It is but proper to state that my esteemed colleague, Prof. Bolivar, in a communication to me recognized that a change, such as I have effected, would probably be necessary, but the

species which is described as *Allotettix prolongatus* he identified as the same as his *perurianus*. The latter is quite unlikely, as a careful comparison will show.

Allotettix, gen. nov.

Body rugose, tuberculate, face oblique, as seen in front, narrow. Vertex narrower than an eye, middle carinate, sulcate on either side, the crown very short, the vertex on a higher plane than the occiput, which slopes backwards, and in front not advanced to the anterior border of the eyes; in profile not visible. Anteriorly subtruncate, passing laterally into little short convexed flexures. Eyes prominent. Frontal costa narrowly divided. Antennae inserted a little below the anterior inferior border; filiform rather short, consisting of fourteen articles, the superior ocelli scarcely perceptible in profile at the middle of the anterior border of the eyes. Pronotum depressed, truncated in front, strongly prolonged posteriorly, ending in a sharp apical process, median carina scarcely elevated, humeral angles obtuse, posterior median lobule of lateral lobes feebly developed, the subhumeral sinus shallow, the posterior angle directed obliquely downward and backwards. Elytra elongate. The first and third articles of the posterior tarsus about equal in length.

Allotettix prolongatus, sp. nov.

Body strongly prolonged, rugose tuberculate, fuscus, narrow, above depressed, tibiae annulated with flavus. Vertex a little narrower than an eye, subnarrowed in front, feebly carinated in the middle, on either side sulcate, anteriorly subtruncate, passing laterally into little convexed flexures, ending abruptly near the anterior inner border of the eye; not advanced as far as the anterior border of the eye, in profile not visible, being obscured by the prominent eyes; frontal costa depressed between the eyes, a little protuberant opposite the antennae, about on a line with their anterior border, the forks as seen in front gradually but narrowly separated, diverging to the middle ocellus. Pronotum anteriorly truncate, posteriorly strongly prolonged, subulate and acuminate, frequently extending within one millimeter of twice the length of the posterior femora, median carina scarcely elevated, sinuate more or less tuberculate in its backward course, dorsum between the shoulders a little unevenly swollen, rugose papillate, just behind strongly depressed, dorsal surface of the apical process rugose, uneven and covered with numerous longitudinal tubercule, lateral angles obtuse, posterior angle of the lateral lobe obtuse, rounded. Elytra elongate, impresso-punctate, with the apex subacutely rounded; wings about as long as the process or scarcely longer. Femore unmodified, slender, the posterior femora narrow, the carinae of tibia with rather small and scarcely more than five or six spines, on the inner carinae as few as three or four beyond the middle; the first article of the

posterior tarsus equal in length to the third, the first and second pulvilli united about equal to the third, the first and second acute, the third straight below.

Length body, 12-13mm., pronot., 16-17 $\frac{1}{2}$ mm., post. fem., 7-7.5mm.
Locality, Bolivia, South America. Hancock.

Allotettix peruvianus, Bol.

Obscure, ferrugineous, fusco variegated. Vertex nearly as wide as an eye, horizontal, anteriorly subnarrowed, in front scarcely transversely carinated; frontal costa between the antennae obliquely depressed, obscurely sinuate. Pronotum posteriorly long and subulate, median carina between the shoulders sinuate, between the shoulders with concavities, posterior angle of the lateral lobe with the apex widely rounded. Elytra oblong, subacuminate; wings as long as the process. Femoral carina unchanged, first article of the posterior tarsi not longer than the third, third pulvillus shorter the second and first united, first pulvillus with the apex shortly spined and acute.

Length of body, ♂ = 9-13.5mm., pronot., 13.5-14mm., post. fem., 5.5-7mm.

Locality—Punamarca, Peru, Museum of Varsovie. Bolivar.

Allotettix cayennensis, Bol.

Pale fuscous, rugulose, vertex narrower than an eye, not produced in front of the eyes, middle carinated, lateral lobes externally rounded; frontal costa between the eyes little sinuate. Pronotum narrow, posteriorly long and subulate, in front of the shoulders, crowded together, median carina a little elevated, between the shoulders subsinuate. Elytra narrowly rounded at the apex. Carinas of the femora undulate, crenulate, posterior femora elongate, before the apex reduced, first and third articles of the posterior tarsi nearly equal in length, apical pulvillus acute, the third pulvillus scarcely shorter than the second and first united. Valves of the ovipositor rather short.

Body length, ♀, 8mm., pronot., 10mm., post. fem., 5.5mm.

Locality, Cayenne (Coll. of M. Brunner). Bolivar.

Among some Tettigidae received from Mexico, through the kindness of Mr. O. W. Barrett, I am able to record a new and very interesting species of *Neotettix* Hancock.

Neotettix barretti, sp. nov.

Body small, rugose-granulate. Vertex fully twice the width of an eye, anterior border convex and advanced considerably in front of the eyes, middle carinate, projecting a little in front and ending backwards at a line drawn across the anterior third of the eyes, feebly sulcate or rather depressed on either side, mammillate posteriorly; frontal costa straight and subvertical, the apex rounded angulate, seen in front the frontal costa strongly forked, the branches starting opposite the middle of the eye, suddenly diverging in their de-

scension, being farther apart between the antennæ where they are parallel, tending to slight convergence at the median ocellus. Antennæ very short, filiform and consisting of twelve articles. They originate as seen in profile at a point a little below and in front of the anterior inferior border of the eye. The posterior ocelli are plainly visible a little in front of the middle of the eyes, midway between the anterior margin of the frontal costa and the eyes. Pronotum anteriorly truncate, the anterior margin of the dorsum crowded forward over the head, a little constricted in front of the shoulders, tectiform, rugose, a little broadened, the humeral angles obtuse, angulate, carinated, the little anterior lateral carinae prominent, median carina of the pronotum strongly elevated, thin, straight above, roundly curving near the anterior border, posterior angle of the lateral lobes widely and obtusely angulate. Elytra narrow, apex subacutely rounded, wings not visible. Anterior femora compressed below, with a small drawn out lobe, ending near the apex; middle femora compressed above, obscurely undulate, inferiorly undulate, with a little median prominence; posterior femora large, the first article of the posterior tarsi exceedingly long, being a third longer than the last article; pulvilli inconspicuous, the first small, the second and third longer and nearly equal in length.

♂. Body length, 7mm., pronot. 7mm., post fem. 4.55m

Locality, Tizapan, D. F., Mexico. O. W. Barrett.

Named in honor of Mr. Barrett, who found this very interesting species.

The vertex is more produced in front of the eyes in this species than any other species of *Nomotettix* with which I am familiar. In a series of specimens from Minnesota, which I have been able to examine through the generosity of Prof. Otto Lugger, there was a single specimen of *Nomotettix* Morse, which though nearly allied to *Nomotettix cristatus* Harris, has some distinguishing characters which seem sufficiently pronounced to separate the species, and which I herewith set forth.

***Nomotettix sinufrons*, sp. nov.**

Body granulate, rugose. Vertex very wide, equal to about twice the width of an eye; middle rather feebly carinate, shallowly sulcate on either side of the median ridge, front border broadly but roundly curved, the mid-carina very little projecting, in profile strongly produced in front of the eyes; frontal costa sinuate opposite the middle of the eyes, protuberant between the antennæ, dorsum of the pronotum anteriorly acute angulate, a little produced over the head, posteriorly subulate, between the shoulders strongly tectiform, behind on the dorsum with a number of

oblique wrinkles, median carina prominent, cristate, depresso convexed, humeral angles obtuse. Elytra narrow, apex subacuminate, wings not reaching to the end of the apical process. Femore unchanged; posterior femora large, the first article of the posterior tarsi much longer than the third, strongly serrulate above, pulvilli straight below.

+, Body length, 9.5mm., pronot. 8.5, post. fem. 6mm.

Locality, St. Anthony Park, Minnesota. Prof. Otto Lugger.

This species is nearly allied to *N. cristatus* Harris, differing from that species principally in the pronotum not being so strongly compressed above, the sinuation not so deep in front of the eyes, the frontal costa more advanced in front of the eyes, the vertex more obtusely conico-angulate. In *N. cristatus* the frontal costal is more deeply excavate and the median carina of the vertex more elevated, giving the crown of the head in profile a more arched appearance. Although described from one specimen, these differences are such as to warrant me without hesitancy in giving this species a place here.

Another point which I would like to bring forward in the present connection is in regard to *Tettix granulatus* Kirby. This species is undoubtedly the same as described by Prof. Bolivar in his Essay, '87, page 266, figs. 22-22a, as *Tettix branneri*, making the latter name synonymous, but on the other hand this is not the species commonly understood as *Tettix granulatus*, found in the northeastern United States and southward, which has a slender form with long subulate pronotum. On the contrary, the true *granulatus* has the body compact, rather large, the wings only extending as far as the apical process, as more fully described below. The result of these researches leaves no other way open but to name the species further southward or in the temperate region, and to make my contention more clear I have described the two species in question.

***Tettix granulatus* Kirby.**

Syn. *Tettix branneri* Bol.

Body granulate, fusco testaceous, above frequently with two black spots. Vertex wider than the eye, middle strongly carinated, quite deeply sulcate on each side, anteriorly obtuse angulate, the facial frontal costal widely sulcate, the branches running sub-parallel, slightly widening at the middle ocellus in profile, the median carina of vertex curved above the eyes; in front opposite the middle of the

eye the frontal costa is shallowly sinuate. Pronotum truncate posteriorly subulate, apex slightly passing the posterior femor, dorsum tectiform, broad between the shoulders, the median carina distinctly elevated, percurrent, near the front margin more compressed, humeral angles obtuse, carinated, the little anterior lateral carina distinct and parallel. Elytra oblong, apex rounded, impresso-punctated, wings extended almost as far as to the apex of the process. Anterior femora obscurely undulate, middle femora unchanged, the posterior femora rather slender, becoming considerably narrower near the apex; carina straight crenulate, the first article of the posterior tarsus above finely serulate, very much longer than the last two united, the pulvilli below straight, the first quite small, the second about twice as long as the first, the third as long as the first two united.

Body length, . . . , 9.12mm., pronot., 10.12mm., post. fem., 5.5-6mm. Bolivar.

The specimen before me measures: Body, . . . 11mm., pronot., 10.5, post. fem., 6mm.

Locality, Hudson Bay. Bolivar.

For the specimen above mentioned in my collection I am indebted to Prof. Bolivar, of Madrid, Spain.

A specimen is said to have been taken in latitude 65° and White found specimens on the borders of the Mackenzie and Slave Rivers, and at Fort Simpson. Bethune relates that this is the species found in New England States and Minnesota, but this is an error. This species is closely related to *Tettix incurvatus* Hancock and *Tettix bipunctatus* of Europe. The latter is much smaller in stature, the median carina proportionately more cristate, approaching *Nomotettix* and the frontal costa of the face is not sinuate. For specimens of the latter species in my collection I am indebted to Mr. Malcolm Burr, of East Grinstead, England. The bibliography of *Tettix granulatus*, as above described, is as follows: Kirby, Fauna, Bor. Amer. IV, p. 251; DeHann, Bijdr. Kenn. Orthopt., 143; White, Rich. Aret. Search, Exp. II, 360; Bethune, Kirby's Fauna, Bor. Amer. Insects, p. 121; Bolivar, Essai s. l. Acrid, tribu. Tettig, Amer. Soc. Ent. Belgique, p. 266, figs. 22-22a.

Tettix morsei, sp. nov.

Syn. *Tettix granulatus* Kirby.

Body granulate or very little rugose, slender, polyornate. Vertex considerably wider than an eye, middle carinate, on each side sulcate from the middle of the eye to the anterior margin, obtuse angulate in front, the median carina not projecting beyond the apex,

in profile angulate produced, the crown substraight showing a little above the eyes; facial frontal costal strongly in advance of the eyes, as seen in front bifurcating near the apex, the branches gradually and but little diverging in their descension, slightly depressed opposite the eyes. Face strongly oblique, the posterior ocelli showing just in front of the middle anterior margin of the eye. Antennæ short, not reaching to the humeral angle. Pronotum anteriorly truncate or barely angulate, the dorsum tectiform, not very broad between the shoulders, median carina distinctly elevated percurrent, nearly straight, sometimes rather undulating, a little more elevated near the anterior border, posteriorly long, slender, subulate, passing considerably beyond the posterior femora, humeral angles, strongly obtuse or subrounded. Wings well developed, passing beyond the apical process, posterior angle of the lateral lobes very slightly and obliquely diverging, strongly obtuse. Elytra oblong, apex subacutely rounded external surface minutely punctate. Anterior femora slender, unchanged, middle femora slender, unchanged, middle femora with straight carinae, the posterior rather slender, very much reduced near the apex, the first article of the posterior tarsus but little longer than the other two united, the pulvilli straight below, the first acute, the second about twice as long as the first, the third as long as the first two united.

Body length, ♂ ♀, 8-10mm, pronot., 11-12.5mm., post. fem., 5.5-6mm.

This is the common form found in most collections. A specimen from Northern Illinois in the collection of Mr. A. Bolter, of Chicago, measured sixteen millimeters in total length, this being the maximal size of any examined.

A series of specimens from St. Anthony Park, Minnesota, showed some departure from the type form. There was variation in the angularity of the vertex, some being very obtuse; the median carina of the pronotum, instead of being straight, was undulating in its backward course, the dorsum was decidedly rugose, the posterior tarsus with the first article a little longer than the last two united, the pulvilli straight below, the first conico-acute, the second and third equal in length were a little longer than the first. In this variety we see an approach to *Tettix luggeri* Hancock.

Var. 2. Abbreviated examples with the pronotum not extending so far backwards, the wings being coincidentally shorter.

The species above described is named in honor of my friend and co-worker, Prof. A. P. Morse.

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THE CATOCALAE OF MONTGOMERY COUNTY, VIRGINIA.

BY PROF. ELLISON A. SMYTH, JR.

The interesting commingling of Northern and subtropical forms in the Lepidoptera of the Alleghanian fauna is well illustrated in the *Catocalæ* of this county. The following notes apply to the immediate neighborhood of Blacksburg, Montgomery County, Virginia, among the Alleghanies and at an elevation of about 2,300 feet.

As far as my observations extend, based upon my own collecting for a number of years, there are twenty-seven good species of *Catocala*, or, counting varietal forms, nearly forty species and varieties found here. More strictly Northern are such species as *C. parta*, *concombens*, *habilis*, *paleogama*, etc., while the following Southern forms occur: *C. viduata* Gn. (*maestosa* Halst.), *desperata* Gn., *lachrymosa* and *sappho*. The past summer was the first occasion of my finding *viduata* here. This species was frequent, though not abundant; and it was with intense surprise that I eagerly bottled two specimens of *C. sappho*, which I had heretofore seen only once alive, in lower South Carolina. How these two species took me back to my old collecting grounds, in the swamps near Charleston, S. C.,